Endarterectomy and shunt: Alternatives or in tandem?

IA Andrievskikh MD*
AV Vazhenin MD**
AV Kuklin MD***

There is no doubt about the efficacy of endarterectomy in the instance of localized occlusions of the arterial tree. The procedure was first developed in 1946 and has been widely used. However, in the case of extensive, non-localized atheromatus disease of the aorta-iliac and the femoral-popliteal-tibial segments in the leg, the majority of vascular surgeons prefer the application of shunts or prosthetics. Nevertheless, there are proponents of extensive obliteration of the endothelium in these regions. There is also the possibility of combining both techniques.

In order to assess the outcomes of the latter technique, we reviewed 567 patients who were operated on for aorta-iliac and for femero-popliteo-tibial disease at Chelyabinsk Centre for Vascular Surgery in Russia from 1987 to 1991.

Five hundred forty-one of these suffered from atherosclerosis. The other 26 patients had non-specific inflammation of arterial system.

The age distribution was 32 to 78 years; there were 551 men and 16 women. Ischemia in the degree of III to IV (according to the scale established by Fontain) was present in 341 patients.

Multi-site occlusions and associated multi-organ disease affected 213 patients. Atheromatous disease was determined by ultrasonography, load tests and angiography.

Results

One hundred thirty-one femoro-popliteal and femorotibial shunt operations were performed. Of these, in 29 (22.3%) the patient developed thromboses in the early post-operative period because of the extensive disease in the tibial arteries. Twenty went on to require amputations and 4 of these amputations had to be performed in the presence of suppuration in the site when there was evidence of erosive bleeding. The mortality rate was 0.8% in this cohort.

Endarterectomy was performed on 149 patients with diseases in the same areas. Early thrombosis occurred in 35 patients (23.5%). Subsequent repeat endaterectomy was successful in 12 of these cases; however, amputations of the extremity had to be performed on 23 of the 35 as a last resort. The mortality rate was again 0.8% overall, but the causes were probably because of the severe concomitant organic disease in these cases.

An interesting fact in the instance of shunting the "blind" segment (the proximal part of only one of 3 collateral arteries being patent) in 8 patients, was that 4 of them developed thrombosis in 2 to 3 weeks post-op, resulting in amputations.

In 15 similarly afflicted patients on whom endarterectomy was performed, 3 required subsequent amputation; the remainder (12) had their arterial tree patent for anywhere from 2 to 5 years. To our mind, in such situations, endarterectomy enables the distal artery to remain patent longer.

Two hundred eighty-three patients were operated on for aorta-iliac occlusive disease; of these 143 had shunts and prosthesis. Thrombosis developed in 24 (16.8%) of these and 10 went on to require amputations. Suppuration occurred surrounding the prosthesis in 7 requiring removal of the prosthesis and amputation in two of the cases; in the other 5 patients a substitute of the prosthesis by an autologous vein segment resulted in a good outcome. Four patients died.

In this area of disease, 144 endarterectomies were performed; in 31 of these the approach was via the retroperitoneal space according to Rob. The results in 5 of these were immediately satisfactory as well as in follow-up.

The endarterectomy was performed transfemorally in 113 cases, utilizing the rings of Vollmar as a technique. Early thrombosis took place in 21 patients (14.6%) and 18 amputations had to be done. Two patients died. Such things as suppurations in the region, aneurysms at the suture sites and other complications attendant on the insertion of prosthetics were not noted in this cohort of patients.

Discussion

Actuarial assessment of the follow-up periods confirmed there was no great difference between the 2 techniques in terms of outcome. It is our opinion that the insignificant difference between the outcome of the 2 techniques is due less to the methods themselves than to the experience and skill of the surgeon, the appropriateness of the operating equipment and instruments available, and the extensiveness of the atheromatous occlusive disease.

We conclude, therefore, that both operative procedures are effective; they complement each other if in the hands of an experienced surgeon.

Shunting is the more common procedure and a relatively more simple method to remedy extensive occulation of the arterial tree. Nevertheless, endarterectomy is more beneficial when the threat of intercurrent disease, such as diabetes and immunosuppression, compromises the likely success of a bypass procedure. The surgery is simplified and the survival of the patient more likely when endarterectomy via the transfemoral route is chosen in the case of multi-organ atheromatous disease being present.

Endarterectomy is more advisable hemodynamically when it is a matter of improving blood-flow into the "blind segment". It can be performed as a first stage procedure; if it fails because of the extent of the occlusive process, then shunting as a second stage is warranted.

Editor's note

We present this article to our readers as an example of what the Russian surgeons in Siberia have been doing during the period of Glasnost and Perestroika—the Gorbachev era. Remarkably, during the 70+ years of the prior Communist dictatorship, such reports were stifled.

In this instance, there was the additional problem of communication between Hawaii and Russia during the post-Gorbachev era—when the infrastructure of the erstwhile Soviet Union has broken down and no effective social structure has as yet ensued to take its place. The example, of course, is in the difficulties we had with the mail, the telephone and facsimile. The article above is as it finally evolved; a Russian physician trying to write in broken English meant that we had to go to-and-fro many times in order to clarify things.

(Continued on page 306) ➤

* Centre for Vascular Surgery
Regional Hospital No. 1
Chelyabinsk, Russia

Submitted for publication 04 Feb 93

SUGARCANE WORKERS: MORBIDITY AND MORALITY

(Continued from page 303)

Medicine: State of the Art Reviews. 1987;2:409-425.
9. Miller FD, Reed D, MacLean C. A prospective study of morbidity and mortality of carpenters in the Honolulu Heart Study. *J Occup Medicine.* 1988;30:(11) 879-882.
10. Newman R. Asbestos-like fibers of biogenic silica in sugarcane. *Lancet.* 1983;2: 8354.
11. Newman R. Association of biogenic silica with disease. *J Nut Cancer.* 1986;8:217-221.
12. Newman R. Fine biogenic silica fibers in sugarcane: a possible hazard. *Ann Occupational Hyg.* 1986;30:365-370.
13. Rothschild H, Voors AW, Weed SG, Vial LJ, Welsh RA, Johnson WD. Trends in respiratory system cancer mortality in Louisiana: Geographic distribution in 1950-1969 and 1967-1976 compared. *Am J Pub Health.* 1979;69:380-381.
14. Rothschild H, Mulvey JJ. An increased risk for lung cancer mortality associated with sugarcane farming. *JNCI.* 1982;68:755-760.
15. Selikoff IJ, Hammond EC. Asbestos-associated disease in United States shipyards. *CA.* 1978; 28:87-99.
16. Steineck G, Carstensen J, Wiklund K. Mesothelioma among sugar refinery workers. *Lancet.* 1983;2:1503.
17. Watt BK, Merrill AL. Composition of Foods-Raw, Processed, Prepared. US Department of Agriculture Handbook No. 8, U.S. Government Printing Office. 1963; pp. 1-237.
18. Yano K, Reed DM and McGee DL. Ten-year incidence of coronary heart disease in the Honolulu Heart Program. *Am J Epid.* 1984;119:5:653-666.

■

ENDARTERECTOMY AND SHUNT: ALTERNATIVES OR IN TANDEM?

(Continued from page 304)

We sent the final copy for peer review to a local vascular surgeon. Here is the reviewer's comment:

"It is quite interesting to see what has been done in their [Siberian] large, centralized institutions; this collection of 567 patients with peripheral arterial occlusive disease is a very good example.

"From a scientific standpoint, the paper would not stand up to major scrutiny for peer review from one of our major vascular journals. However, when the source of the paper is placed in perspective, the statistics do become of considerable interest. One would have to question whether the series of endarterectomies versus the shunt procedures were randomized in some fashion, or whether a selection process took place. The follow-up of 2 to 5 years really represents early results in the majority of patients. The technique of endarterectomy utilizing the Vollmar rings is one that is practiced in Europe but is not practiced very often in the United States to my knowledge.

"The bottom line of rather similar results between the 2 techniques has been reported in our literature. Some of the numbers might be a bit different, but all in all the net results seem similar between the experience reported here (in the article above) and much of the reported experience from America.

"...I think it would be interesting to many readers of the Hawaii Medical Journal. I don't think a great deal of editing would be appropriate or necessary to justify publication. Actually, it probably would be impossible to get reliable data."

We add one additional comment: The principal author, Igor Andrievskikh, together with the Chelyabinsk Hospital's chief radiologist Vyasheslav Sharov, were in Hawaii in March 1993. They spoke to several groups about Chelyabinsk's major problem with the release of radionuclides from the Mayak nuclear weapons manufacturing complex in the southern Ural mountains (Chelyabinsk-70). Probably of greater interest to their listeners were the accounts of life and the practice of medicine in Russia. Igor was fortunate enough to witness a balloon coronary angioplasty performed at Queen's. He was shocked after seeing the $650 catheter being discarded. "We would have cleaned it and sterilized it for repeated use," he expostulated; "such a rare and expensive thing, in our country."

J I Frederick Reppun MD

■